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Montana's Ground Water and Surface Water Uses

Critical Resources

Ground water and surface water are critical resources for human consumption and agriculture; our farms and industries use immense quantities and their protection may be one of the most important environmental issues of this decade.

Montana's ground water is the source for nearly 40 percent of public water supply withdrawals, nearly 80 percent of withdrawals for mining uses, over half of industrial use (self-supplied) withdrawals, and about 30 percent of livestock use withdrawals. Irrigation accounts for over 40 percent of total ground water withdrawals in Montana.

Ground water from wells is used for more than one purpose. The largest single use of ground water in Montana is for domestic purposes (55 percent). Agricultural purposes, such as irrigation and stock watering account for 33 percent of the wells used in Montana.

Agricultural Use

There are 43,856 wells used for domestic purposes: of these, 38,389 wells are used for stock watering and 5,467 wells are used for irrigation. Irrigation of crops accounts for 98 percent of ground water withdrawals in Montana (about 9,000 mgd), however, only 22 percent of the water withdrawn for irrigation is actually used by plants. Canal leakage and irrigation return flows account for most of the remaining 78 percent of water withdrawn. Ground water supplies about 1 percent of total irrigation withdrawals. About 10 percent of ground water withdrawals for irrigation are in Flathead County.

Rural Domestic Use

Approximately half of Montana's residents rely on ground water as their source of water for domestic uses, through both public and rural water supply systems. Per capita use averages about 78 gallons per day (gpd) for rural users and about 129 gpd for publicly supplied users.

Private domestic supplies use 72,830 wells, or 54.6 percent of the total number of wells in Montana. The 204,000 rural residents of Montana use approximately 16 million gallons per day (mgd) of water for domestic purposes, almost 95 percent of which is derived from ground water sources.

Municipal Domestic Use

Recent estimates indicate that 595,000 people (almost 75 percent of Montana's population) are served by public water supply systems. A public water supply is defined as a water system "for the provision of water for human consumption from any community well, water hauler for cisterns, water bottling plant, water dispenser, or other water supply that serves 10 or more families, or 25 or more persons daily, or has at least 10 service connections at least 60 days out of the calendar year" (Administrative Rules of Montana (ARM) 16.20.202). The 1,391 wells provide ground water which is the source for nearly 40 percent of withdrawals for public water-supply systems statewide. Domestic use accounts for 77 mgd of a total of 134 mgd delivered by public water-supply systems. Of the remaining 57 mgd delivered, 25 mgd is supplied for commercial and industrial uses, and 32 million gallons is attributed to public use (parks, etc.) and system losses.

Montana's well use (Montana Bureau of Mines and Geology, 1992).

Purpose	Number of Wells
Domestic	72,830
Stock Water	38,389
Irrigation	5,467
Public Water Supply	1,391
Industrial	1,066
Commercial	1,026
Monitoring	2,233
Research	858
Recreation	232
Fire Protection	187
Institutional	297
Medical	28
Water Flood	94
Injection	8
Test Wells	132
Wildlife	1
Unused/Abandoned	1,606
Other	595
Unknown	6,842
Total Number of Well Records Evaluated	113,857

Note: Some wells may be used for more than one purpose.

Industrial Use

Ground water is the source of water for over half of the industrial uses in the state.

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TABLE 2.1. Estimated withdrawals in Montana, millions gallons per day (mgd) rounded to nearest 1 mgd (figures may not add to the totals due to independent rounding), (USGS, 1993).

	Irrigation	**Public Supply**	**Industrial Self-Supplied**	**Livestock**	**Fossil Fuel Power Use**	**Mining**	**Rural Domestic**	**Total (all uses)**
Ground Water	90	51	30	16	0	15	15	218
Surface Water	8,910	83	27	35	33	4	1	9,100

Industrial and commercial facilities use 2,092 wells. Industrial use accounts for about 14 percent of the ground water withdrawn in Montana. Of a total of 58 mgd of ground water withdrawn for industrial purposes, about 21 mgd are used in Missoula County and about 13 mgd in Lincoln County.

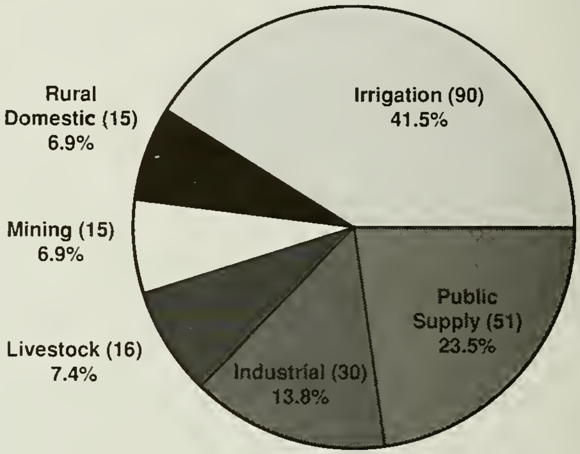
Instream Flow

Ground water contributes to the flow of many streams and plays an important role in maintaining stream flow during low-flow periods. Springs serve as the source of water for many Montana Department of Fish, Wildlife and Parks (FWP) fish hatcheries.

The Montana Department of Natural Resources and Conservation (DNRC) has granted two state agencies water rights for instream flow protection in various streams throughout the state. FWP has been granted reservations to: protect fish and wildlife habitat; contribute to and maintain a clean, healthful and desirable environment and to sustain adequate levels of water quality. The Montana Department of Health and Environmental Sciences has been granted reservations for the main-stem Missouri River to dilute naturally occurring arsenic, especially during low-flow periods.

Recreational Use

Recreational uses such as golf courses and city park irrigation are classified by the DNRC as irrigation if they are self-supplied. Included in this category are cemeteries, many of which are irrigated. Public supply systems provide water for many of these facilities. About 230 wells are used for recreational purposes according to the 1992 GWIC data.



Estimated ground water withdrawals in Montana during 1990, rounded to nearest 1 mgd, (United States Geological Survey, 1993).

Wildlife Use

Many wildlife species, particularly aquatic birds, are dependent upon wetland habitats which are influenced by ground water.

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